What Works? The Diabetes Care and Information Center

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This report focuses on the contribution of a referral practice that offers specialist diabetes care to a multi-ethnic population in New York, and describes the process and outcome of an intensive management policy that is particularly strong on communication. The Diabetes Care and Information Center (DCIC), which practices shared care with local primary care physicians, has developed a programme of intensive management for Type 1 and Type 2 diabetes based on a detailed initial patient assessment by a physician, nurse-educator and dietician team. The assessment is followed by an individualized programme of patient education that includes a combination of individual and group education, and counselling. Patients are followed up primarily by an educator or a physician, with frequent interdisciplinary communication to optimize self-care procedures. Medication programmes for patients with Type 2 diabetes include monotherapy and combination therapy with oral agents and single or multiple doses of insulin. Metabolic improvement has been demonstrated by significant changes in mean HbA_{1c}. In addition to initial assessment and routine metabolic follow up, the DCIC provides routine screening and treatment for micro- and macrovascular complications of diabetes, which results in early referral to podiatrists, vascular surgeons and ophthalmologists for appropriate preventive care.

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Introduction

The Diabetes Care and Information Center (DCIC) is a multidisciplinary private endocrinology practice in Queens, New York, staffed by three full-time endocrinologists, four part-time diabetes nurse educators and two dieticians. The DCIC serves a multi-ethnic middle class and working class community with a large immigrant population. Approximately 50 % of patients are of northern European heritage, with the remainder being either Asian, Caribbean, South American and African-American. As is typical for the United States, most DCIC patients are covered by health insurance that pays for part or all of their healthcare and a smaller portion of medication costs. Approximately one-third of diabetes patients attending the DCIC have Type 1 diabetes and two-thirds have Type 2 diabetes, with 40–50 women per year who have gestational diabetes. The DCIC is a referral practice that offers specialist diabetes care; most patients are also followed by a primary internist or family practitioner, but receive their diabetes care at the DCIC or by referral to affiliated specialists (e.g. podiatry or ophthalmology).

Programme Philosophy and Goals

The primary aim of the DCIC is to provide a co-ordinated team approach to diabetes management, while reinforcing that the primary responsibility for diabetes care remains with the patient. A combination of individual and group education is used, but the major focus of the intensive control programme for people with Type 1 or Type 2 diabetes is one-on-one counselling with the physician and diabetes educators. The aim of improved metabolic control is achieved through a combination of patient education and medical management. The healthcare team and the patient work together to make necessary changes in behaviour and medications. Patients are taught modifications of diet, exercise and, when the disease progresses, oral hypoglycaemic agents and insulin, to maintain good control between visits. When pharmacological intervention is necessary, patients are educated in the proper use of their tablets or insulin. In this way, the patient is empowered in self-management and is more able to maintain glycaemic control between visits to the centre. We encourage contact by telephone and telefax as often as necessary.

New Patients

Most patients (approximately one-third have Type 1 diabetes and two-thirds Type 2 diabetes) are referred to

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the DCIC by their primary care physicians, with a smaller number self-referred or referred by other patients. The most common initial visit is a 75-minute consultation with an endocrinologist. With approximately 10 % of patients, busy physician schedules result in the preliminary evaluation being carried out by a nurse educator or dietician, or both, followed within 1–2 weeks by the physician consultation. This approach is an effective and efficient system, which will be expanded in the future. Approximately 50 % of new patients first seen by the physician are subsequently evaluated within one week to one month by a registered dietician and a diabetes nurse educator. Although all patients are encouraged to participate with the education team, personal preference and reimbursement issues, such as inadequate insurance for healthcare, and scheduling problems may make this impossible for some.

Initial Visit Structure

New Patients are sent a six page basic questionnaire before the initial visit. In addition to demographic and insurance information, the request for information includes questions about duration and treatment of diabetes, associated complications (including decreased vision, erectile dysfunction, symptomatic neuropathy and nephropathy, and macrovascular disease), and previous diabetes education and treatment. Patients are asked to identify their personal aims and areas of greatest difficulty in managing diabetes. The physician history begins with a standard complete history including the main complaint, a history of present illness, social, past medical and family histories, and systems review. Further questions focus on diabetes-specific issues including how the diagnosis was made, specific symptoms, previous medication history, history or symptoms of micro- and macrovascular complications, and the daily pattern of blood glucose monitoring, diet and physical activity.

Educator Assessment

The diabetes educator begins the assessment, establishing a positive relationship with the patient. This first step is essential for the educator who assumes the role of a case manager, and is followed by a discussion of the DCIC philosophy of care and the patient's personal aims. For example, a young female patient may wish to become pregnant or the older patient may be concerned with weight loss, or with maintaining a busy lifestyle. In each case, a successful management plan will take the patient's wishes into consideration. During the session, the educator assesses the patient's present health status, resource utilization, knowledge of diabetes management, technical skills, cultural and social factors, health beliefs and attitudes, support systems, barriers to learning, and emotional response to diabetes. A preliminary management plan is developed in collaboration with the patient and an education plan that may include referral to the DCIC group education programme, individual educator visits, or a combination of the two. The most important aspect of the initial visit is to take nothing for granted and re-assess each patient, regardless of the type of diabetes, as if newly diagnosed for that visit.

Patient Follow Up

The physicians and educators, who are in close proximity, facilitate formal and informal discussion and consultation. After the patient has visited the physician and one or more educators, the team discuss the patient, and a treatment and follow-up plan is developed with the patient's participation. Primary case management may be provided by either an educator or a physician, and may change from one team member to another as the patient's individual needs change. The specific pattern of patient follow up depends largely on individual patient requirements. For example, a young patient using an insulin pump will work primarily with the educator for the entire time they are in the practice. The relatively stable patient with Type 2 diabetes controlled on oral agents and diet will, ideally, see the educator once a year for re-evaluation and will have quarterly follow-up visits with the physician for the majority of their course of treatment.

The patient who needs intensive education on appropriate diet will work primarily with the registered dietician; the nurse educator may provide education focussed on other self-care aspects of diabetes including blood glucose determination, stress management, hygiene and foot care. The role of the physician in the management of this type of patient may be consultative, and to ensure that routine screening for complications and treatment of other medical problems are carried out.

The diabetic patient being treated with insulin or considering pregnancy will work primarily with a nurse educator, learning individual insulin action patterns and developing a personalized self-management algorithm. The dietician's role for this patient may initially be limited to providing a basic meal plan, followed later by teaching carbohydrate counting and helping develop an individual 'glycaemic index'. At each educator visit, the nurse or dietician has the opportunity to consult with a physician; in more complex cases, the physician joins the educator visit to review suggested therapeutic changes. In all cases, however, the patient's diabetologist reviews the chart after each educator visit.

The third pattern seen commonly is that of the patient who has been on a diet for several months or longer, has been instructed in self-care, and now needs modification or initiation of medications. This patient may be followed either by the nurse educator or, as is more usual, by the physician. Even in this case, however, regular 'maintenance' visits and a semi-annual review alternately with the nurse educator and the dietician are encouraged.

Approximately 50 % of patients are followed up by a

physician alone without educator support. These patients are seen on a regular basis by the endocrinologist who focuses mainly on medication adjustment or screening, and monitoring of complications, but has minimal time for patient education. These patients are seen an average of every 1–2 months until the medication regimen is stable and the glycosylated haemoglobin is within the desired target range. Most patients are seen quarterly thereafter.

Whether patients are followed primarily by the education team or medical team, most patients visit the physician who initially evaluated them four times a year. Three visits a year focus on medications and blood glucose control issues. A minimal physical exam is included, focussed particularly on unstable chronic complications; a patient's feet are examined at each visit.

Once a year, patients have a 'full physical' visit, which consists of an interval history, particularly reviewing current medications and routine diabetes care items such as ophthalmologic, dental and podiatric care. Vaccination status and other preventive care, such as mammography, sigmoidoscopy and gynaecological follow up are included, and patients are reminded to follow up with their primary physician to ensure continuity of care. A diabetes and cardiovascular physical examination is performed annually, which follows the guidelines of the American Diabetes Association Standards of Medical Care for Patients with Diabetes Mellitus. Routine laboratory testing includes standard chemistry and complete blood cell count screening, glycosylated haemoglobin, thyroid function tests and urine screen for microalbuminuria. Any patient with a positive urine screen also completes a 24-hour urine collection for creatinine clearance and albumin. Patients who have not been seen by a diabetes educator within the previous year are encouraged to return to the nurse educator and dietician for re-assessment at this time.

Medications

New patients with Type 2 diabetes with minimal or no symptoms begin with a 2–3 month trial of 'behaviour change therapy'. If the patient has a persistently elevated glycohaemoglobin after this period, pharmacological therapy is instituted. The first stage is usually monotherapy with an oral agent, e.g. glipizide GITS or glimepiride, metformin or troglitazone. The choice of medication is made by the individual physician after consultation with the patient and takes into consideration underlying chronic disease, patient habits and habitus, and special patient concerns. Monotherapy is continued and titrated to effective doses according to patient reports of self-monitored blood glucose levels and periodic glycohaemoglobin levels. If the patient reaches the maximum dose of any one drug, combination with other agents or insulin are instituted.

Before the introduction in the USA of metformin and, subsequently, troglitazone, a 'bedtime insulin, daytime sulphonylurea' (BIDS) regimen was the most common next step. This approach is still used for the patient in whom metformin and troglitazone are not indicated, and is also an effective transition step to multiple-dose insulin for the patient in whom combination oral therapy with a sulphonylurea and metformin or troglitazone is not effective. Several patients, who appear to be severely insulin resistant, are currently on metformin and troglitazone combination therapy; more obese Type 2 diabetic patients may even require a combination of three drugs and, on occasion, two-to-three drugs plus insulin. However, the current litigious climate in the USA limits the use of such unusual therapy in a private practice setting.

Once diabetes progresses and insulin is required, many of the patients who come to the DCIC are desperate to avoid insulin therapy. The education team is, however, usually able to overcome this resistance with continued support and customized education. When BIDS or multiple-dose insulin is necessary, the patient is seen by a diabetes nurse educator at the same time as his or her physician. This continuity provides the security necessary to minimize the stress of beginning injections. The approach to insulin in Type 2 patients is similar to that in the Type 1 population. Patients keep careful records of carbohydrate intake, physical exercise and insulin injections. Although most patients with Type 2 diabetes are well controlled with a two-injection regimen (30/70 mix twice daily, or 30/70 mix before breakfast and NPH at bedtime), some insulinopaenic patients require a three-injection regimen of NPH/regular insulin before breakfast, regular insulin at the evening meal, and NPH at bedtime similar to the regimen used for some Type 1 diabetic patients.

Communication

The reason for the DCIC's 'success story' is communication and teamwork. Healthcare professionals and patients work together in an environment of mutual respect and support, and by providing a complete diabetes healthcare team under one roof, the DCIC provides a setting for free and easy communication among the team members. This communication may take many different forms, the most common of which are:

- *Joint visits* The patient works with an educator for 30–60 minutes, and the physician will join in for 5–10 minutes near the end of the visit to review, assist with problem solving and reinforce what has occurred. At times, the patient's other educator may join in these sessions, which provides an opportunity for the patient to work with their full healthcare team.
- *Team conference* Once a week, the full diabetes team meets to discuss clinical issues including specific patient concerns.

- *Informal consultations* On an average day, two or three physicians, one dietician and three nurse educators are present in the office. Informal two-way (nurse–dietician, nurse–physician, or dietitian–physician) or three-way (nurse–dietitian–physician) discussions are facilitated by the patient's full healthcare team being available.

Conclusions

The DCIC provides a single-site, comprehensive, multidisciplinary, diabetes healthcare team. The model of care discussed here is an effective way of providing collaborative diabetes care in a private practice setting and does not require the full resources of a large clinic, university or hospital centre.

Suggested Reading

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